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SEQUENCE LISTING

<110> The Council of the Queensland Institute of Medical Research

5 <120> NOVEL IMMUNOGENIC LIPOPEPTIDES COMPRISING T-HELPER

<130> 94947/MRO

<150> US 60/402839

10 <151> 2002-08-12

<160> 177

15 <170> PatentIn version 3.1

<210> 1

20 <211> 15

<212> PRT

25 <213> synthetic T-helper epitope

<400> 1

30 Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser  
1 5 10 15

35 <210> 2

<211> 9

<212> PRT

40 <213> synthetic CTL epitope

45 <400> 2

Thr Tyr Gln Arg Thr Arg Ala Leu Val  
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50 <210> 3

<211> 24

55 <212> PRT

<213> synthetic peptide comprising CTL and Th epitope

60 <400> 3

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Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Thr  
 1 5 10 15

5 Tyr Gln Arg Thr Arg Ala Leu Val  
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10 <210> 4

<211> 25

<212> PRT

15 <213> synthetic peptide comprising CTL and Th epitope

20 <400> 4

Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Lys  
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25 Thr Tyr Gln Arg Thr Arg Ala Leu Val  
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30 <210> 5

<211> 27

<212> PRT

35 <213> synthetic peptide comprising CTL and Th epitope

40 <400> 5

Lys Leu Ile Pro Asn Ala Ser Leu Ile Glu Asn Cys Thr Lys Ala Glu  
 1 5 10 15

45 Leu Lys Thr Tyr Gln Arg Thr Arg Ala Leu Val  
 20 25

50 <210> 6

<211> 27

<212> PRT

55 <213> synthetic peptide comprising CTL and Th epitope

60 <400> 6

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Lys Leu Ile Pro Asn Ala Ser Leu Ile Glu Asn Cys Thr Lys Ala Glu  
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5 Leu Lys Asn Leu Val Pro Met Val Ala Thr Val  
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<210> 7

10

<211> 27

<212> PRT

15 <213> synthetic peptide comprising CTL and Th epitope

<400> 7

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Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu Asn Ser Val Leu Glu Pro  
 1 5 10 15

25 Ile Lys Asn Leu Val Pro Met Val Ala Thr Val  
 20 25

<210> 8

30

<211> 27

<212> PRT

35 <213> synthetic peptide comprising CTL and Th epitope

<400> 8

40

Thr Ala Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu  
 1 5 10 15

45 Asn Lys Asn Leu Val Pro Met Val Ala Thr Val  
 20 25

<210> 9

50

<211> 27

<212> PRT

55 <213> synthetic peptide comprising CTL and Th epitope

<400> 9

60

Pro Arg Tyr Ile Ala Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu

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	<210>	10														
10	<211>	27														
	<212>	PRT														
15	<213>	synthetic peptide comprising CTL and Th epitope														
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	<210>	11														
30	<211>	27														
	<212>	PRT														
35	<213>	synthetic peptide comprising CTL and Th epitope														
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Asn Lys Tyr Leu Leu Glu Met Leu Trp Arg Leu  
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5  
<210> 13  
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<212> PRT  
<213> synthetic peptide comprising CTL and Th epitope  
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<400> 13  
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20 1 5 10 15  
Ser Lys Tyr Leu Leu Glu Met Leu Trp Arg Leu  
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<212> PRT  
<213> synthetic T-helper epitope  
35  
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Gly Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser  
40 1 5 10 15  
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45  
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<212> PRT  
<213> synthetic T-helper epitope  
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<210> 16

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<211> 17  
<212> PRT  
5 <213> synthetic T-helper epitope

<400> 16  
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15 Asn

<210> 17  
20 <211> 17  
<212> PRT  
25 <213> synthetic T-helper epitope

<400> 17  
30 Ile Gly Thr Asp Asn Val His Tyr Lys Ile Met Thr Arg Pro Ser His  
1 5 10 15  
35 Gln

<210> 18  
40 <211> 17  
<212> PRT  
45 <213> synthetic T-helper epitope

<400> 18  
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1 5 10 15  
55 Ile

<210> 19  
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&lt;211&gt; 17

&lt;212&gt; PRT

5 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 19

10

Ser His Gln Tyr Leu Val Ile Lys Leu Ile Pro Asn Ala Ser Leu Ile  
1 5 10 15

15 Glu

&lt;210&gt; 20

20

&lt;211&gt; 17

&lt;212&gt; PRT

25 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 20

30

Lys Leu Ile Pro Asn Ala Ser Leu Ile Glu Asn Cys Thr Lys Ala Glu  
1 5 10 15

35 Leu

&lt;210&gt; 21

40

&lt;211&gt; 17

&lt;212&gt; PRT

45 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 21

50

Leu Ile Glu Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu  
1 5 10 15

55 Leu

&lt;210&gt; 22

60

- 8 -

<211> 17  
<212> PRT  
5 <213> synthetic T-helper epitope

<400> 22  
10 Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu Asn Ser Val Leu Glu Pro  
1 5 10 15  
15 Ile

<210> 23  
20 <211> 17  
<212> PRT  
25 <213> synthetic T-helper epitope

<400> 23  
30 Lys Leu Leu Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu  
1 5 10 15  
35 Met

<210> 24  
40 <211> 17  
<212> PRT  
45 <213> synthetic T-helper epitope

<400> 24  
50 Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys Asn Val Lys Pro  
1 5 10 15  
55 Leu

<210> 25  
60



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&lt;211&gt; 17

&lt;212&gt; PRT

5 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 25

10 Thr Leu Met Thr Lys Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Gly  
1 5 10 15

15 Arg

20 &lt;210&gt; 26

&lt;211&gt; 17

&lt;212&gt; PRT

25 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 26

30 Lys Pro Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Arg Arg Phe Ala  
1 5 10 15

35 Gly

&lt;210&gt; 27

40 &lt;211&gt; 17

&lt;212&gt; PRT

45 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 27

50 Ser Gly Arg Arg Gln Arg Arg Phe Ala Gly Val Val Leu Ala Gly Val  
1 5 10 15

55 Ala

&lt;210&gt; 28

60

- 10 -

&lt;211&gt; 17

&lt;212&gt; PRT

5 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 28

10 Phe Ala Gly Val Val Leu Ala Gly Val Ala Leu Gly Val Ala Thr Ala  
1 5 10 15

15 Ala

&lt;210&gt; 29

20

&lt;211&gt; 17

&lt;212&gt; PRT

25 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 29

30

Gly Val Ala Leu Gly Val Ala Thr Ala Ala Gln Ile Thr Ala Gly Ile  
1 5 10 15

35 Ala

&lt;210&gt; 30

40

&lt;211&gt; 17

&lt;212&gt; PRT

45 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 30

50

Gly Ile Ala Leu His Gln Ser Asn Leu Asn Ala Gln Ala Ile Gln Ser  
1 5 10 15

55 Leu

&lt;210&gt; 31

60

- 11 -

&lt;211&gt; 17

&lt;212&gt; PRT

5 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 31

10

Asn Leu Asn Ala Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln  
1 5 10 15

15 Ser

&lt;210&gt; 32

20

&lt;211&gt; 17

&lt;212&gt; PRT

25 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 32

30

Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala Ile Glu Glu  
1 5 10 15

35 Ile

&lt;210&gt; 33

40

&lt;211&gt; 17

&lt;212&gt; PRT

45 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 33

50

Glu Gln Ser Asn Lys Ala Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu  
1 5 10 15

55 Thr

&lt;210&gt; 34

60

- 12 -

<211> 17

<212> PRT

5 <213> synthetic T-helper epitope

<400> 34

10 Ser Ser Lys Thr Gln Thr His Thr Gln Gln Asp Arg Pro Pro Gln Pro  
1 5 10 15

15 Ser

<210> 35

20 <211> 17

<212> PRT

25 <213> synthetic T-helper epitope

<400> 35

30 Gln Pro Ser Thr Glu Leu Glu Glu Thr Arg Thr Ser Arg Ala Arg His  
1 5 10 15

35 Ser

<210> 36

40 <211> 17

<212> PRT

45 <213> synthetic T-helper epitope

<400> 36

50 Arg His Ser Thr Thr Ser Ala Gln Arg Ser Thr His Tyr Asp Pro Arg  
1 5 10 15

55 Thr

<210> 37

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- 13 -

&lt;211&gt; 17

&lt;212&gt; PRT

5 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 37

10

Pro Arg Thr Ser Asp Arg Pro Val Ser Tyr Thr Met Asn Arg Thr Arg  
1 5 10 15

15 Ser

&lt;210&gt; 38

20

&lt;211&gt; 17

&lt;212&gt; PRT

25 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 38

30

Thr Arg Ser Arg Lys Gln Thr Ser His Arg Leu Lys Asn Ile Pro Val  
1 5 10 15

35 His

&lt;210&gt; 39

40

&lt;211&gt; 17

&lt;212&gt; PRT

45 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 39

50

Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro Ile Ser  
1 5 10 15

55 Ala

&lt;210&gt; 40

60

- 14 -

&lt;211&gt; 17

&lt;212&gt; PRT

5 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 40

10

Pro Arg Tyr Ile Ala Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu  
1 5 10 15

15 Ser

&lt;210&gt; 41

20

&lt;211&gt; 17

&lt;212&gt; PRT

25 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 41

30

Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg Thr Leu Val Ser Gly  
1 5 10 15

35 Thr

&lt;210&gt; 42

40

&lt;211&gt; 17

&lt;212&gt; PRT

45 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 42

50

Asp Glu Ser Ser Cys Val Phe Val Ser Glu Ser Ala Ile Cys Ser Gln  
1 5 10 15

55 Asn

&lt;210&gt; 43

60

- 15 -

&lt;211&gt; 17

&lt;212&gt; PRT

5 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 43

10

Thr	Ser	Thr	Ile	Ile	Asn	Gln	Ser	Pro	Asp	Lys	Leu	Leu	Thr	Phe	Ile
1				5					10					15	

15 Ala

&lt;210&gt; 44

20

&lt;211&gt; 17

&lt;212&gt; PRT

25 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 44

30

Ser	Pro	Asp	Lys	Leu	Leu	Thr	Phe	Ile	Ala	Ser	Asp	Thr	Cys	Pro	Leu
1				5					10					15	

35 Val

&lt;210&gt; 45

40

&lt;211&gt; 24

&lt;212&gt; PRT

45 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 45

50

Ser	Thr	Ala	Pro	Pro	Ala	His	Gly	Val	Thr	Ser	Ala	Pro	Asp	Thr	Arg
1				5					10					15	

55 Ala Pro Gly Ser Thr Ala Pro Pro  
20

&lt;210&gt; 46

60

- 16 -

&lt;211&gt; 19

&lt;212&gt; PRT

5 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 46

10

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala  
1 5 10 15

15 Ser Ser Leu

&lt;210&gt; 47

20

&lt;211&gt; 18

&lt;212&gt; PRT

25 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 47

30

Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala  
1 5 10 15

35 Ser Leu

&lt;210&gt; 48

40

&lt;211&gt; 27

&lt;212&gt; PRT

45 &lt;213&gt; synthetic T-helper epitope

&lt;400&gt; 48

50

Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro  
1 5 10 1555 Ala Pro Gly Ser Thr Ala Pro Pro Lys Lys Gly  
20 25

&lt;210&gt; 49

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- 17 -

<211> 26  
<212> PRT  
5 <213> synthetic T-helper epitope

<400> 49  
10 Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg  
1 5 10 15  
15 Pro Ala Pro Gly Ser Thr Ala Pro Pro Lys  
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<210> 50  
20 <211> 4  
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25 <213> synthetic T-helper epitope

<400> 50  
30 Gly Val Ala Glu  
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35 <210> 51  
<211> 10  
<212> PRT  
40 <213> synthetic T-helper epitope

45 <400> 51  
Thr Ala Ser Gly Val Ala Glu Thr Thr Asn  
1 5 10  
50 <210> 52  
<211> 16  
55 <212> PRT  
<213> synthetic T-helper epitope

60 <400> 52

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Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala Thr Tyr Gln Phe  
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5 <210> 53  
 <211> 23

10 <212> PRT  
 <213> synthetic CTL epitopes

15 <400> 53  
 Lys Pro Lys Asp Glu Leu Asp Tyr Glu Asn Asp Ile Glu Lys Lys Ile  
 1 5 10 15

20 Cys Lys Met Glu Lys Cys Ser  
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25 <210> 54  
 <211> 21

30 <212> PRT  
 <213> synthetic CTL epitopes

35 <400> 54  
 Asp Ile Glu Lys Lys Ile Cys Lys Met Glu Lys Cys Ser Ser Val Phe  
 1 5 10 15

40 Asn Val Val Asn Ser  
 20

45 <210> 55  
 <211> 9

50 <212> PRT  
 <213> synthetic CTL epitopes

55 <400> 55  
 Lys Pro Ile Val Gln Tyr Asp Asn Phe  
 1 5

60

- 19 -

&lt;210&gt; 56

&lt;211&gt; 17

5 &lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

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&lt;400&gt; 56

Gly Ile Ser Tyr Tyr Glu Lys Val Leu Ala Lys Tyr Lys Asp Asp Leu  
1 5 10 15

15

Glu

20

&lt;210&gt; 57

&lt;211&gt; 22

25 &lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

30

&lt;400&gt; 57

Glu Phe Thr Tyr Met Ile Asn Phe Gly Arg Gly Gln Asn Tyr Trp Glu  
1 5 10 15

35

His Pro Tyr Gln Lys Ser  
20

40

&lt;210&gt; 58

&lt;211&gt; 19

45 &lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

50

&lt;400&gt; 58

Asp Gln Pro Lys Gln Tyr Glu Gln His Leu Thr Asp Tyr Glu Lys Ile  
1 5 10 15

55

Lys Glu Gly

60

- 20 -

<210> 59  
<211> 10  
5 <212> PRT  
<213> synthetic CTL epitopes

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<400> 59  
Asn Met Trp Gln Glu Val Gly Lys Ala Met  
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<210> 60  
<211> 10  
20 <212> PRT  
<213> synthetic CTL epitopes

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Ala Pro Thr Lys Ala Lys Arg Arg Val Val  
1 5 10

30  
<210> 61  
35 <211> 10  
<212> PRT  
<213> synthetic CTL epitopes

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<400> 61  
45 Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys  
1 5 10

50  
<210> 62  
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<212> PRT  
55 <213> synthetic CTL epitopes

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Thr Val Tyr Tyr Gly Val Pro Val Trp Lys

- 21 -

1	5	10
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10	<213> synthetic CTL epitopes	
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20	<210> 64	
	<211> 10	
	<212> PRT	
25	<213> synthetic CTL epitopes	
30	<400> 64	
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35	<210> 65	
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40	<212> PRT	
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50	<210> 66	
	<211> 10	
55	<212> PRT	
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&lt;400&gt; 66

Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys  
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5

&lt;210&gt; 67

&lt;211&gt; 10

10

&lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

15

&lt;400&gt; 67

Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys  
1 5 10

20

&lt;210&gt; 68

25

&lt;211&gt; 9

&lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

30

&lt;400&gt; 68

Arg Leu Arg Pro Gly Gly Lys Lys Lys  
1 5

35

&lt;210&gt; 69

40

&lt;211&gt; 10

&lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

45

&lt;400&gt; 69

Gly Pro Gly His Lys Ala Arg Val Leu Ala  
1 5 10

50

&lt;210&gt; 70

55

&lt;211&gt; 10

&lt;212&gt; PRT

60

- 23 -

&lt;213&gt; synthetic CTL epitopes

5 &lt;400&gt; 70

Ser	Pro	Ile	Glu	Thr	Val	Pro	Val	Lys	Leu
1				5					10

10

&lt;210&gt; 71

&lt;211&gt; 10

15 &lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

20

&lt;400&gt; 71

Ile	Leu	Lys	Glu	Pro	Val	His	Gly	Val	Tyr
1				5					10

25

&lt;210&gt; 72

&lt;211&gt; 9

30

&lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

35

&lt;400&gt; 72

Ala	Ile	Phe	Gln	Ser	Ser	Met	Thr	Lys
1				5				

40

&lt;210&gt; 73

45 &lt;211&gt; 10

&lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

50

&lt;400&gt; 73

Ser	Pro	Ala	Ile	Phe	Gln	Ser	Ser	Met	Thr
1				5					10

60

&lt;210&gt; 74

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<211> 10  
<212> PRT  
5 <213> synthetic CTL epitopes

<400> 74  
10 Gln Val Arg Asp Gln Ala Glu His Leu Lys  
1 5 10

15 <210> 75  
<211> 10  
<212> PRT  
20 <213> synthetic CTL epitopes

25 <400> 75  
Gly Pro Lys Val Lys Gln Trp Pro Leu Thr  
1 5 10

30 <210> 76  
<211> 9  
35 <212> PRT  
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40 <400> 76  
Thr Tyr Gln Arg Thr Arg Ala Leu Val  
1 5

45 <210> 77  
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50 <212> PRT  
<213> synthetic CTL epitopes

55 <400> 77  
Thr Tyr Gln Arg Thr Arg Ala Leu Val Arg Thr Gly Met Asp Pro  
60 1 5 10 15



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<210> 78  
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<213> synthetic CTL epitopes  
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Ile Ala Ser Asn Glu Asn Met Asp Ala Met Glu Ser Ser Thr Leu  
15 1 5 10 15  
<210> 79  
20 <211> 9  
<212> PRT  
<213> synthetic CTL epitopes  
25  
<400> 79  
30 Lys Ala Val Tyr Asn Phe Ala Thr Met  
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<210> 80  
35 <211> 9  
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40 <213> synthetic CTL epitopes  
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45 Gln Val Lys Trp Arg Met Thr Thr Leu  
1 5  
50 <210> 81  
<211> 9  
<212> PRT  
55 <213> synthetic CTL epitopes  
60 <400> 81

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Val Phe Ser Asp Gly Arg Val Ala Cys  
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5 <210> 82  
<211> 9  
<212> PRT  
10 <213> synthetic CTL epitopes

15 <400> 82  
Val Pro Ala Pro Ala Gly Pro Ile Val  
1 5

20 <210> 83  
<211> 9  
25 <212> PRT  
<213> synthetic CTL epitopes

30 <400> 83  
Thr Tyr Ser Ala Gly Ile Val Gln Ile  
1 5

35 <210> 84  
<211> 10  
40 <212> PRT  
<213> synthetic CTL epitopes

45 <400> 84  
Leu Leu Asp Phe Val Arg Phe Met Gly Val  
1 5 10

55 <210> 85  
<211> 10  
<212> PRT  
<213> synthetic CTL epitopes  
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<400> 85  
5 Gln Asn Gly Ala Leu Ala Ile Asn Thr Phe  
1 5 10  
  
10 <210> 86  
<211> 9  
<212> PRT  
15 <213> synthetic CTL epitopes  
  
20 <400> 86  
Val Ser Ser Asp Gly Arg Val Ala Cys  
1 5  
  
25 <210> 87  
<211> 9  
<212> PRT  
30 <213> synthetic CTL epitopes  
  
35 <400> 87  
Val Ser Ser Glu Gly Arg Val Ala Cys  
1 5  
  
40 <210> 88  
<211> 9  
45 <212> PRT  
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50 <400> 88  
Val Ser Ser Asp Gly Arg Val Pro Cys  
1 5  
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<210> 89  
<211> 9  
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- 28 -

<212> PRT  
<213> synthetic CTL epitopes  
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<400> 89  
Val Ser Ser Asp Gly Leu Val Ala Cys  
10 1 5  
  
<210> 90  
15 <211> 9  
<212> PRT  
<213> synthetic CTL epitopes  
20  
  
<400> 90  
25 Val Ser Ser Asp Gly Gln Val Ala Cys  
1 5  
  
<210> 91  
30 <211> 9  
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35 <213> synthetic CTL epitopes  
  
<400> 91  
40 Val Ser Ser Asp Gly Arg Val Val Cys  
1 5  
  
45 <210> 92  
<211> 10  
<212> PRT  
50 <213> synthetic CTL epitopes  
  
55 <400> 92  
Val Pro Ala Pro Pro Val Gly Pro Ile Val  
1 5 10  
60

- 29 -

&lt;210&gt; 93

&lt;211&gt; 10

5 &lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

10

&lt;400&gt; 93

Val	Glu	Ile	Thr	Pro	Tyr	Glu	Pro	Thr	Gly
1				5					10

15

&lt;210&gt; 94

&lt;211&gt; 10

20

&lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

25

&lt;400&gt; 94

Val	Glu	Ile	Thr	Pro	Tyr	Glu	Pro	Thr	Trp
1				5					10

30

&lt;210&gt; 95

35 &lt;211&gt; 10

&lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

40

&lt;400&gt; 95

Val	Glu	Leu	Thr	Pro	Tyr	Lys	Pro	Thr	Trp
1				5					10

45

&lt;210&gt; 96

50

&lt;211&gt; 9

&lt;212&gt; PRT

55 &lt;213&gt; synthetic CTL epitopes

&lt;400&gt; 96

60

Arg Arg Ile Tyr Asp Leu Ile Lys Leu

1 5

5 <210> 97  
<211> 9  
<212> PRT  
10 <213> synthetic CTL epitopes

15 <400> 97  
Arg Lys Ile Tyr Asp Leu Ile Glu Leu  
1 5

20 <210> 98  
<211> 9  
<212> PRT  
25 <213> synthetic CTL epitopes

30 <400> 98  
Pro Tyr Leu Phe Trp Leu Ala Gly Ile  
1 5

35 <210> 99  
<211> 13  
40 <212> PRT  
<213> synthetic CTL epitopes

45 <400> 99  
Thr Ser Leu Tyr Asn Leu Arg Arg Gly Thr Ala Leu Ala  
1 5 10

50 <210> 100  
<211> 10  
55 <212> PRT  
<213> synthetic CTL epitopes

60

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<400> 100  
Asp Thr Pro Leu Ile Pro Leu Thr Ile Phe  
1 5 10  
5  
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<211> 11  
10  
<212> PRT  
<213> synthetic CTL epitopes  
15  
<400> 101  
Thr Val Phe Tyr Asn Ile Pro Pro Met Pro Leu  
1 5 10  
20  
<210> 102  
25 <211> 10  
<212> PRT  
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<400> 102  
35 Val Glu Ile Thr Pro Tyr Lys Pro Thr Trp  
1 5 10  
40  
<210> 103  
<211> 9  
<212> PRT  
45 <213> synthetic CTL epitopes  
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<400> 103  
Val Ser Phe Ile Glu Phe Val Gly Trp  
1 5  
55  
<210> 104  
<211> 9  
<212> PRT  
60

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&lt;213&gt; synthetic CTL epitopes

5 &lt;400&gt; 104

Phe Arg Lys Ala Gln Ile Gln Gly Leu  
1 5

10

&lt;210&gt; 105

&lt;211&gt; 9

15 &lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

20

&lt;400&gt; 105

Phe Leu Arg Gly Arg Ala Tyr Gly Leu  
1 5

25

&lt;210&gt; 106

&lt;211&gt; 9

30

&lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

35

&lt;400&gt; 106

Gln Ala Lys Trp Arg Leu Gln Thr Leu  
1 5

40

&lt;210&gt; 107

45 &lt;211&gt; 9

&lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

50

&lt;400&gt; 107

55 Ser Val Arg Asp Arg Leu Ala Arg Leu  
1 5

60

&lt;210&gt; 108



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<211> 9

<212> PRT

5 <213> synthetic CTL epitopes

<400> 108

10 Tyr Pro Leu His Glu Gln His Gly Met  
1 5

15 <210> 109

<211> 9

<212> PRT

20 <213> synthetic CTL epitopes

<400> 109

25 His Leu Ala Ala Gln Gly Met Ala Tyr  
1 5

30 <210> 110

<211> 9

35 <212> PRT

<213> synthetic CTL epitopes

40 <400> 110

Arg Pro Pro Ile Phe Ile Arg Arg Leu  
1 5

45 <210> 111

<211> 9

50 <212> PRT

<213> synthetic CTL epitopes

55 <400> 111

60 Arg Leu Arg Ala Glu Ala Gly Val Lys  
1 5

<210> 112  
<211> 9  
5 <212> PRT  
<213> synthetic CTL epitopes  
10  
<400> 112  
Ile Val Thr Asp Phe Ser Val Ile Lys  
15 1 5  
<210> 113  
20 <211> 10  
<212> PRT  
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25  
<400> 113  
30 Ala Val Phe Asp Arg Lys Ser Asp Ala Lys  
1 5 10  
<210> 114  
35 <211> 15  
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40 <213> synthetic CTL epitopes  
<400> 114  
45 Asn Pro Thr Gln Ala Pro Val Ile Gln Leu Val His Ala Val Tyr  
1 5 10 15  
50 <210> 115  
<211> 15  
<212> PRT  
55 <213> synthetic CTL epitopes  
60 <400> 115

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Leu Pro Gly Pro Gln Val Thr Ala Val Leu Leu His Glu Glu Ser  
1 5 10 15

5 <210> 116

<211> 14

<212> PRT

10

<213> synthetic CTL epitopes

15 <400> 116

Asp Glu Pro Ala Ser Thr Glu Pro Val His Asp Gln Leu Leu  
1 5 10

20

<210> 117

<211> 8

25 <212> PRT

<213> synthetic CTL epitopes

30

<400> 117

Arg Tyr Ser Ile Phe Phe Asp Tyr  
1 5

35

<210> 118

<211> 9

40

<212> PRT

<213> synthetic CTL epitopes

45

<400> 118

Ala Val Leu Leu His Glu Glu Ser Met  
1 5

50

<210> 119

55

<211> 11

<212> PRT

<213> synthetic CTL epitopes

60

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<400> 119  
5 Arg Arg Ala Arg Ser Leu Ser Ala Glu Arg Tyr  
1 5 10

<210> 120  
10  
<211> 10  
<212> PRT  
15 <213> synthetic CTL epitopes

<400> 120  
20 Glu Glu Asn Leu Leu Asp Phe Val Arg Phe  
1 5 10

<210> 121  
25  
<211> 9  
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30  
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<400> 121  
35 Lys Glu His Val Ile Gln Asn Ala Phe  
1 5

<210> 122  
40  
<211> 9  
45 <212> PRT  
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<400> 122  
50  
Arg Arg Ile Tyr Asp Leu Ile Glu Leu  
1 5  
55  
<210> 123  
<211> 9  
60

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&lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

5

&lt;400&gt; 123

10 Gln Pro Arg Ala Pro Ile Arg Pro Ile  
1 5

&lt;210&gt; 124

15 &lt;211&gt; 9

&lt;212&gt; PRT

20 <213> synthetic CTL epitopes

&lt;400&gt; 124

25 Glu Gly Gly Val Gly Trp Arg His Trp  
1 5

&lt;210&gt; 125

30

&lt;211&gt; 9

&lt;212&gt; PRT

35 <213> synthetic CTL epitopes

&lt;400&gt; 125

40

Cys Leu Gly Gly Leu Leu Thr Met Val  
1 5

45 &lt;210&gt; 126

&lt;211&gt; 9

&lt;212&gt; PRT

50

&lt;213&gt; synthetic CTL epitopes

55 &lt;400&gt; 126

Arg Arg Arg Trp Arg Arg Leu Thr Val  
1 5

60

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<210> 127  
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5 <212> PRT  
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10  
<400> 127  
Arg Ala Lys Phe Lys Gln Leu Leu  
1 5  
15  
<210> 128  
<211> 16  
20 <212> PRT  
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25  
<400> 128  
Arg Lys Cys Cys Arg Ala Lys Phe Lys Gln Leu Leu Gln His Tyr Arg  
30 1 5 10 15  
<210> 129  
35 <211> 9  
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45 Tyr Leu Leu Glu Met Leu Trp Arg Leu  
1 5  
50  
<210> 130  
<211> 9  
<212> PRT  
55 <213> synthetic CTL epitopes  
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<400> 130  
Tyr Phe Leu Glu Ile Leu Trp Gly Leu

1 5

5 <210> 131  
<211> 9  
<212> PRT  
10 <213> synthetic CTL epitopes

15 <400> 131  
Tyr Leu Leu Glu Ile Leu Trp Arg Leu  
1 5

20 <210> 132  
<211> 9  
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25 <213> synthetic CTL epitopes

30 <400> 132  
Tyr Leu Gln Gln Asn Trp Trp Thr Leu  
1 5

35 <210> 133  
<211> 9  
40 <212> PRT  
<213> synthetic CTL epitopes

45 <400> 133  
Leu Leu Leu Ala Leu Leu Phe Trp Leu  
1 5

50 <210> 134  
<211> 9  
55 <212> PRT  
<213> synthetic CTL epitopes

60

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<400> 134  
Leu Leu Val Asp Leu Leu Trp Leu Leu  
1 5  
5  
<210> 135  
<211> 9  
10 <212> PRT  
<213> synthetic CTL epitopes  
15  
<400> 135  
Leu Leu Leu Ile Ala Leu Trp Asn Leu  
20 1 5  
<210> 136  
25 <211> 9  
<212> PRT  
<213> synthetic CTL epitopes  
30  
<400> 136  
35 Trp Leu Leu Leu Phe Leu Ala Ile Leu  
1 5  
40 <210> 137  
<211> 9  
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45 <213> synthetic CTL epitopes  
  
<400> 137  
50 Thr Leu Leu Val Asp Leu Leu Trp Leu  
1 5  
55 <210> 138  
<211> 9  
<212> PRT  
60



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<213> synthetic CTL epitopes

5 <400> 138

Leu Leu Trp Leu Leu Leu Phe Leu Ala  
1 5

10

<210> 139

<211> 9

15 <212> PRT

<213> synthetic CTL epitopes

20

<400> 139

Ile Leu Leu Ile Ile Ala Leu Tyr Leu  
1 5

25

<210> 140

<211> 9

30

<212> PRT

<213> synthetic CTL epitopes

35

<400> 140

40 Val Leu Phe Ile Phe Gly Cys Leu Leu  
1 5

<210> 141

45 <211> 9

<212> PRT

<213> synthetic CTL epitopes

50

<400> 141

55 Arg Leu Gly Ala Thr Ile Trp Gln Leu  
1 5

<210> 142

60

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&lt;211&gt; 9

&lt;212&gt; PRT

5 &lt;213&gt; synthetic CTL epitopes

&lt;400&gt; 142

10

Ile Leu Tyr Phe Ile Ala Phe Ala Leu  
1 5

15 &lt;210&gt; 143

&lt;211&gt; 9

&lt;212&gt; PRT

20

&lt;213&gt; synthetic CTL epitopes

25 &lt;400&gt; 143

Ser Leu Val Ile Val Thr Thr Phe Val  
1 5

30

&lt;210&gt; 144

&lt;211&gt; 9

35 &lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

40

&lt;400&gt; 144

Leu Met Ile Ile Pro Leu Ile Asn Val  
1 5

45

&lt;210&gt; 145

&lt;211&gt; 9

50

&lt;212&gt; PRT

&lt;213&gt; synthetic CTL epitopes

55

&lt;400&gt; 145

Thr Leu Phe Ile Gly Ser His Val Val  
60 1 5

5       <210> 146  
      <211> 9  
      <212> PRT  
      <213> synthetic CTL epitopes  
10  
      <400> 146  
      Leu Ile Pro Glu Thr Val Pro Tyr Ile  
15       1                   5  
  
      <210> 147  
20       <211> 9  
      <212> PRT  
      <213> synthetic CTL epitopes  
25  
      <400> 147  
30       Val Leu Gln Trp Ala Ser Leu Ala Val  
      1                   5  
  
35       <210> 148  
      <211> 9  
      <212> PRT  
40       <213> synthetic CTL epitopes  
  
45       <400> 148  
      Gln Leu Thr Pro His Thr Lys Ala Val  
      1                   5  
  
50       <210> 149  
      <211> 12  
      <212> PRT  
55       <213> synthetic CTL epitopes  
  
60       <400> 149

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Ser Val Leu Gly Pro Ile Ser Gly His Val Leu Lys  
1 5 10

5 <210> 150

<211> 11

<212> PRT

10

<213> synthetic CTL epitopes

15 <400> 150

Phe Thr Ser Gln Tyr Arg Ile Gln Gly Lys Leu  
1 5 10

20

<210> 151

<211> 11

25 <212> PRT

<213> synthetic CTL epitopes

30

<400> 151

Phe Val Phe Pro Thr Lys Asp Val Ala Leu Arg  
1 5 10

35

<210> 152

<211> 8

40

<212> PRT

<213> synthetic CTL epitopes

45

<400> 152

Phe Pro Thr Lys Asp Val Ala Leu  
1 5

50

<210> 153

55

<211> 9

<212> PRT

<213> synthetic CTL epitopes

60

<400> 153  
5 Asn Leu Val Pro Met Val Ala Thr Val  
1 5

<210> 154  
10  
<211> 9  
<212> PRT  
15 <213> synthetic CTL epitopes

<400> 154  
20 Met Leu Asn Ile Pro Ser Ile Asn Val  
1 5

<210> 155  
25  
<211> 9  
<212> PRT  
30  
<213> synthetic CTL epitopes

<400> 155  
35 Arg Ile Phe Ala Glu Leu Glu Gly Val  
1 5

<210> 156  
40  
<211> 11  
45 <212> PRT  
<213> synthetic CTL epitopes

<400> 156  
50 Thr Pro Arg Val Thr Gly Gly Gly Gly Ala Met  
1 5 10

<210> 157  
55  
<211> 11  
60

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<212> PRT  
<213> synthetic CTL epitopes  
5  
<400> 157  
Arg Pro His Glu Arg Asn Gly Phe Thr Val Leu  
10 1 5 10  
<210> 158  
15 <211> 9  
<212> PRT  
<213> synthetic CTL epitopes  
20  
<400> 158  
25 Arg Leu Leu Gln Thr Gly Ile His Val  
1 5  
<210> 159  
30 <211> 9  
<212> PRT  
35 <213> synthetic CTL epitopes  
<400> 159  
40 Val Ile Gly Asp Gln Tyr Val Lys Val  
1 5  
45 <210> 160  
<211> 9  
<212> PRT  
50 <213> synthetic CTL epitopes  
55 <400> 160  
Ala Leu Phe Phe Phe Asp Ile Asp Leu  
1 5  
60

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<210> 161  
<211> 11  
5 <212> PRT  
<213> synthetic CTL epitopes  
10  
<400> 161  
Tyr Ser Glu His Pro Thr Phe Thr Ser Gln Tyr  
1 5 10  
15  
<210> 162  
<211> 9  
20  
<212> PRT  
<213> synthetic CTL epitopes  
25  
<400> 162  
Val Leu Cys Pro Lys Asn Met Ile Ile  
1 5  
30  
<210> 163  
<211> 9  
<212> PRT  
<213> synthetic CTL epitopes  
40  
<400> 163  
45 Asp Ile Tyr Arg Ile Phe Ala Glu Leu  
1 5  
50  
<210> 164  
<211> 10  
<212> PRT  
55 <213> synthetic CTL epitopes  
  
<400> 164  
60 Ile Leu Ala Arg Asn Leu Val Pro Met Val

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	1	5	10
5	<210>	165	
	<211>	10	
	<212>	PRT	
10	<213>	synthetic CTL epitopes	
15	<400>	165	
	Glu Phe Phe Trp Asp Ala Asn Asp Ile Tyr		
	1	5	10
20	<210>	166	
	<211>	9	
	<212>	PRT	
25	<213>	synthetic CTL epitopes	
30	<400>	166	
	Ile Pro Ser Ile Asn Val His His Tyr		
	1	5	
35	<210>	167	
	<211>	9	
40	<212>	PRT	
	<213>	synthetic CTL epitopes	
45	<400>	167	
	Tyr Ile Leu Glu Glu Thr Ser Val Met		
	1	5	
50	<210>	168	
	<211>	9	
55	<212>	PRT	
	<213>	synthetic CTL epitopes	
60			



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<400> 168  
Cys Val Glu Thr Met Cys Asn Glu Tyr  
1 5  
5

<210> 169  
<211> 9  
10 <212> PRT  
<213> synthetic CTL epitopes  
15

<400> 169  
Arg Arg Ile Glu Glu Ile Cys Met Lys  
20 1 5

<210> 170  
25 <211> 11  
<212> PRT  
<213> synthetic CTL epitopes  
30

<400> 170  
35 Thr Thr Val Tyr Pro Pro Ser Ser Thr Ala Lys  
1 5 10

<210> 171  
40 <211> 9  
<212> PRT  
45 <213> synthetic CTL epitopes

<400> 171  
50 Arg Arg Tyr Pro Asp Ala Val Tyr Leu  
1 5

55 <210> 172  
<211> 9  
<212> PRT  
60

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&lt;213&gt; Listeria monocytogenes CTL epitope

5 &lt;400&gt; 172

Gly Tyr Lys Asp Gly Asn Glu Tyr Ile  
1 5

10

&lt;210&gt; 173

&lt;211&gt; 8

15 &lt;212&gt; PRT

&lt;213&gt; Ovalbumin CTL epitope

20

&lt;400&gt; 173

Ser Ile Ile Asn Phe Glu Lys Leu  
1 5

25

&lt;210&gt; 174

&lt;211&gt; 26

30

&lt;212&gt; PRT

&lt;213&gt; synthetic peptide comprising CTL epitope and T-helper epitope

35

&lt;400&gt; 174

40 Lys Leu Ile Pro Asn Ala Ser Leu Ile Glu Asn Cys Thr Lys Ala Glu  
1 5 10 15Leu Lys Ser Ile Ile Asn Phe Glu Lys Leu  
20 25

45

&lt;210&gt; 175

&lt;211&gt; 27

50

&lt;212&gt; PRT

&lt;213&gt; synthetic peptide comprising T helper and CTL epitope

55

&lt;400&gt; 175

60 Lys Leu Ile Pro Asn Ala Ser Leu Ile Glu Asn Cys Thr Lys Ala Glu  
1 5 10 15

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Leu Lys Gly Tyr Lys Asp Gly Asn Glu Tyr Ile  
20 25

5  
<210> 176  
<211> 9

10  
<212> PRT  
<213> CTL epitope from core protein of hepatitis C virus

15  
<400> 176  
Asp Leu Met Gly Tyr Ile Pro Leu Val  
1 5

20  
<210> 177  
<211> 27

25  
<212> PRT  
<213> Synthetic peptide [P25]-Lys-[HCV]

30  
<400> 177  
Lys Leu Ile Pro Asn Ala Ser Leu Ile Glu Asn Cys Thr Lys Ala Glu  
1 5 10 15

35  
Leu Lys Asp Leu Met Gly Tyr Ile Pro Leu Val  
20 25

40